ABSTRACT

[0092]   This invention provides a method for designing a waveguide profile based

upon predicted performance measurements of the waveguide.   The method involves

establishing a design metric, such as the change in acoustic reactance along the transition

of the waveguide.   Initial values may then assigned for the radius or diameter of the

throat of the waveguide as well as values for the initial slope of the waveguide along the

major and minor (or x and y) axis and the depth of the waveguide.   The waveguide may

then be divided into two or more sections.   The values of the slopes for each section are

then altered based upon the design metric.   When using the change of acoustic reactance

as the design metric, the slope of each section of the waveguide is adjusted to minimize

the change in acoustic reactance between the sections, which is the desired performance

standard.   Once the slopes of each section are adjusted to achieve minimal change in

acoustic reactance, the sections are concatenated together and the curve is smoothed

using a polynomial function order curve fit to create a waveguide profile.   This profile

correlates with the design measurements, which allows for the prediction of the

performance standards and/or dispersion characteristics of the waveguide.   This allows

for design iterations to be made to the waveguide to adjust for performance

measurements without building a prototype.